

CLAIMS

1 A superconducting metal oxide complex, having
2 the formula $(L_{1-x}M_x)_aA_bO_y$, wherein "L" is scandium,
3 yttrium, lanthanum, cerium, praseodymium, neodymium,
4 samarium, europium, gadolinium, terbium, dysprosium,
5 holmium, erbium, thulium, ytterbium, or lutetium, or a
6 combination thereof; "M" is barium, strontium, calcium,
7 magnesium, mercury, or a combination thereof; "A" is
8 copper, bismuth, titanium, tungsten, zirconium, tantalum,
9 niobium, vanadium or a combination thereof:
10 "x" is from about 0.01 to 1.0;
11 "a" is 1 to 2;
12 "b" is 1; and
13 "y" is about 2 to about 4.

1 2. The oxide complex of claim 1 wherein "L" is
2 yttrium, lanthanum, neodymium, samarium, europium,
3 gadolinium, erbium or lutetium, "M" is barium or
4 strontium, "A" is copper, "a" is 1 and "x" is from about
5 0.65 to about 0.80.

1 3. The oxide complex of claim 2 wherein "M" is
2 barium and "x" is about 0.667.

1 4. The oxide complex of claim 3 wherein "L" is
2 yttrium, lanthanum or lutetium.

1 5. The oxide complex of claim 1 wherein the oxide
2 complex has the formula



4 and θ has a number value from about 0.1 to about 4.5

1 6. The oxide complex of claim 5 wherein "L" is
2 yttrium, lanthanum, neodymium, samarium, europium,
3 gadolinium, erbium or lutetium, "M" is barium or
4 strontium, "A" is copper.

1 7. The oxide complex of claim 6 wherein θ has a
2 number value from about 0.1 to about 1.0.

1 8. The oxide complex of claim 7 wherein θ has a
2 number value of from about 0.1 to about 0.5.

1 9. The oxide complex of claim 8 wherein "L" is
2 yttrium, lanthanum or lutetium and "M" is barium.

1 10. A superconducting metal oxide complex having the
2 formula $(L_{1-x}M_x)_aA_bO_y$, wherein "L" is scandium, yttrium,
3 lanthanum, cerium, praseodymium, neodymium, samarium,
4 europium, gadolinium, terbium, dysprosium, holmium, erbium,
5 thulium, ytterbium, or lutetium, or a combination thereof;
6 "M" is barium, strontium, calcium, magnesium, mercury, or
7 a combination thereof; "A" is copper bismuth, titanium,
8 tungsten, zirconium, tantalum, niobium, vanadium or a
9 combination thereof; "a" is 1 to 2; "b" is 1; "x" is from
10 about 0.01 to 1.0, and "y" is about 2 to about 4; said
11 complex made by a process comprising the steps of:
12 compressing a mixture of solid powdered
13 compounds containing L, M, A and O in proportions
14 appropriate to yield said formula;
15 heating the compressed powder mixture to a
16 temperature of from about 800°C to about 1000°C for a time
17 sufficient to react the compressed mixture in the solid
18 state; and
19 quenching said reacted compressed mixture to
20 ambient temperature.

1 11. The oxide complex of claim 10 wherein "L" is
2 yttrium, lanthanum, neodymium, samarium, europium,
3 gadolinium, erbium or lutetium, "M" is barium or
4 strontium, "A" is copper, "a" is 1 and "x" is from about
5 0.65 to about 0.80.

1 12. The oxide complex of claim 11 wherein the solid
2 compounds containing L are L_2O_3 , the solid compounds
3 containing "M" are MCO_3 and the solid compounds containing
4 A are AO .

1 13. The oxide complex of claim 12 wherein "M" is
2 barium and "x" is about 0.667.

1 14. The oxide complex of claim 13 wherein the
2 compressed powder mixture is heated under a reduced oxygen
3 atmosphere of about 2000 μ at a temperature of from about
4 820°C to about 950°C.

1 15. The oxide complex of claim 14 wherein "L" is
2 yttrium, lanthanum or lutetium, "M" is barium and "A" is
3 copper.

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